

## **ALZHEIMER'S DISEASE**

- Dementia makes it hard to remember and think clearly, affecting daily life.
- Alzheimer's is the most common type of dementia (60-80% of cases).
- It usually happens to older people, with most being 65 or older.
- If it affects someone younger than 65, it's called "younger-onset" or "early-onset Alzheimer's."
- Alzheimer's progresses over time, starting with mild memory loss.
- Trouble remembering new things is an early sign.
- Brain changes in Alzheimer's affect learning and cause memory loss, confusion, and more.
- In later stages, people struggle to talk or react to their surroundings.
- Symptoms worsen as the disease spreads through the brain.
- People with Alzheimer's might not realize they need help, so family and friends should watch for signs of dementia.

### **What is Amyloid Plaque?**

Amyloid plaque is a sticky buildup of a protein called beta-amyloid that forms between nerve cells (neurons) in the brain. Too much amyloid plaque is thought to play a key role in Alzheimer's disease by disrupting how neurons work and communicate with each other.

### **What is Tau?**

Tau is another protein in the brain that normally helps stabilize the internal structure of neurons. In Alzheimer's disease, tau forms into twisted tangles inside neurons. These tau tangles are thought to block the transport of nutrients and other molecules inside neurons, causing them to die.

### **What is a Plasma Amyloid Marker?**

A plasma amyloid marker is a blood test that measures the levels of beta-amyloid in the bloodstream. High levels may indicate a buildup of amyloid plaques in the brain. This test is relatively new, and more research is being done on how accurate it is at detecting Alzheimer's disease.

### **What is a PET Scan?**

A positron emission tomography (PET) scan is a type of imaging test that allows doctors to see amyloid plaques and tau tangles in the brain. During the scan, a small amount of a radioactive drug is injected into the bloodstream. This drug attaches to amyloid and tau, allowing the scanner to produce detailed 3D images of the brain showing their location and amount.

## What is a Lumbar Puncture?

A lumbar puncture, also called a spinal tap, is a procedure where a thin needle is inserted into the lower back to collect cerebrospinal fluid (CSF) that surrounds the brain and spinal cord. Levels of beta-amyloid and tau in the CSF can help diagnose Alzheimer's disease. While very accurate, a lumbar puncture is more invasive than a blood test or PET scan.

## What are Sensitivity and Specificity?

Sensitivity and specificity refer to how accurate these tests are:

- Sensitivity is how well a test finds people who really have the disease (a high sensitivity means the test has few false negatives).
- Specificity is how well a test rules out people who don't have the disease (a high specificity means the test has few false positives).

Here are some examples of the Sensitivity and Specificity of some of the tests for Alzheimer's testing:

### 1. Plasma Amyloid Marker:

- Sensitivity: 80-95%
- Specificity: 75-90% Plasma amyloid marker tests are relatively new and their accuracy is still being refined. Current research suggests they have good sensitivity for detecting Alzheimer's disease but may have more false positives compared to other tests.

(Karikari et al., 2020; Palmqvist et al., 2020)

### 2. PET Scan:

- Amyloid PET:
  - Sensitivity: 90-95%
  - Specificity: 85-90%
- Tau PET:
  - Sensitivity: 80-95%
  - Specificity: 85-95% PET scans are highly accurate for detecting the presence of amyloid plaques and tau tangles in the brain. Amyloid PET is slightly more sensitive, while tau PET has a bit higher specificity.

(Barthel et al., 2021; Fleisher et al., 2020)

### 3. Lumbar Puncture (CSF Analysis):

- Beta-amyloid:
  - Sensitivity: 80-95%

- Specificity: 85-95%
- Tau:
  - Sensitivity: 80-95%
  - Specificity: 85-95% Lumbar punctures are considered the gold standard for diagnosing Alzheimer's disease based on CSF biomarkers. They have high sensitivity and specificity for detecting abnormal levels of both beta-amyloid and tau proteins.

(Hansson et al., 2019; Leitao et al., 2021)

### **Eating Right for Alzheimer's Disease: The MIND and Bredesen Diets**

If you or a loved one are concerned about Alzheimer's disease, you may have heard about special diets that could help protect the brain. Two popular options are the MIND diet and the Bredesen diet. Let's take a closer look at what these diets involve and how they might be helpful.

#### **The MIND Diet**

The MIND diet combines parts of the Mediterranean diet and the DASH (Dietary Approaches to Stop Hypertension) diet, both of which are known for their health benefits. The name "MIND" stands for Mediterranean-DASH Intervention for Neurodegenerative Delay.

This diet focuses on foods that are good for the brain, such as:

- Green leafy vegetables
- Other vegetables
- Nuts
- Berries
- Beans
- Whole grains
- Fish
- Poultry
- Olive oil
- Wine (in moderation)

The MIND diet also recommends limiting foods that may be bad for brain health, such as red meat, butter, cheese, pastries, sweets, and fried or fast food.

(Morris et al., 2015; Hosking et al., 2019; Berendsen et al., 2018)

## **The Bredesen Diet**

The Bredesen diet, also known as the ReCODE Protocol, was developed by Dr. Dale Bredesen. It's a more complex program that looks at 36 different factors that can affect brain health, including diet, exercise, sleep, stress, and various medical conditions.

The diet part of the Bredesen protocol emphasizes:

- Low glycemic index foods (foods that don't cause a big spike in blood sugar)
- Healthy fats like those found in nuts, seeds, avocados, and olive oil
- Non-starchy vegetables
- Limited fruit intake
- Moderate amounts of protein from wild-caught fish, pastured eggs, and grass-fed meat
- Avoiding gluten, dairy, and processed foods

In addition to diet changes, the Bredesen protocol also recommends regular exercise, stress reduction techniques, getting enough sleep, and taking certain supplements.

**The Bottom Line** While both the MIND and Bredesen diets show promise for supporting brain health and potentially reducing the risk of Alzheimer's disease, it's important to remember that there is no surefire way to prevent the condition. These diets are based on research but are not guaranteed to work for everyone.

Before making big changes to your eating habits, it's always a good idea to talk with your doctor or a registered dietitian. They can help you decide if one of these diets is right for you and make sure you're still getting all the nutrients your body needs.

In general, eating a balanced diet rich in whole foods like vegetables, fruits, whole grains, lean proteins, and healthy fats is a smart choice for overall health, including brain health. Combining a nutritious diet with regular exercise, mentally stimulating activities, and staying socially connected may offer the most benefits for keeping your brain sharp as you age.

(Bredesen et al., 2018; Toups et al., 2022)

## **AGITATION RELATED TO ALZHEIMER'S DISEASE**

People who have Alzheimer's disease become agitated when they are antsy, angry, or worried. This can show up in several ways, such as

**Pacing:** They might walk back and forth in the same area over and over.

**Repetitive Movements:** They could repeat the same actions or words again and again without stopping.

**Fidgetiness:** They may constantly shift in their seat, tap their fingers, or play with objects.

**Impulsive Behavior:** Sometimes, they might do things without thinking, like suddenly leaving the house or grabbing at objects.

**Handwringing:** They may wring their hands or clasp and unclasp their fingers repeatedly.

**Repetitive Questions or Sentences:** They may ask the same questions or say the same sentences repeatedly.

**Making Strange Noises:** They might make unusual sounds or vocalizations.

**Inappropriate Disrobing:** They may undress inappropriately, regardless of the setting or situation.

**Hiding or Hoarding Things:** They might hide objects or collect and hoard items without reason.

These behaviors can happen because their brain is affected by the disease, making it hard for them to understand or communicate their needs and feelings.

Agitation can occur for a variety of reasons:

**Confusion:** People with Alzheimer's often feel lost and confused, which can make them angry and antsy.

**Unmet needs:** They may be trying to tell you something, like that they're hungry or in pain, but they can't say it clearly.

**Discomfort:** Being physically uncomfortable, like being too hot or too cold, can make them angry.

**Overstimulation:** They can't handle loud noises, busy places, or too much going on.

## **PSYCHOSIS RELATED TO ALZHEIMER'S DISEASE**

People with dementia, including Alzheimer's disease, often experience psychiatric symptoms like psychosis.

Psychosis includes symptoms such as delusions, hallucinations, disorganized thinking, and abnormal movement behavior.

Unfortunately, there are currently no approved medications specifically for treating psychosis in Alzheimer's disease.

### **What Are Delusions?**

Delusions are believing in things that aren't true or real. It involves someone strongly believing in something despite a lack of evidence and contrary beliefs held by others.

**Example:** Imagine someone with Alzheimer's thinking that strangers are trying to steal their things, even though this is not happening.

### **What Are Hallucinations?**

Hallucinations are when someone sees, hears, feels, or smells things that aren't there. It's like having "sensory" experiences that others can't perceive.

**Example:** Someone might hear voices or see people in the room who aren't there due to hallucinations.

### **What Is Disorganized Thinking?**

Disorganized thinking is when a person's thoughts become jumbled and don't make sense. They may have trouble organizing their thoughts or speaking clearly.

**Example:** Someone might start talking about one thing and then suddenly switch to a completely different topic without any connection.

### **What Is Disorganized Motor Behavior?**

This is when a person's movements or actions become strange or don't follow a usual pattern. It's like doing things that don't seem to fit the situation.

**Example:** Someone might start dancing in the middle of a serious conversation or make unusual hand gestures that don't match what they're saying.

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